

CLAIMS

We claim:

1. A method of implementing a barrier to fluid flow in at least one direction, said barrier embedded within porous material incorporating an emplaced topmost section having a topmost surface suitable for use by wheeled traffic, comprising:
5 applying at least one layer of an adhesive material to an entire first surface of said porous material, said applying done to said first surface prior to emplacing said topmost section;
 placing at least one panel incorporating at least one layer of non-porous
10 material upon a topmost one of said at least one layers of an adhesive material, overlapping edges of said panel with edges of any said panels placed adjacent thereto,
 wherein said panels completely cover said topmost layer of said adhesive material;
15 establishing a seal between all said overlapped edges; and
 emplacing at least one layer of material comprising said topmost section upon each said panel such that each said panel is confined below said topmost section and above said topmost layer of adhesive,
 wherein emplacing said panels, establishing a seal between said overlapped edges
20 of said panels, as appropriate, and emplacing said topmost section completes implementation of said barrier.
2. The method of claim 1 in which said barrier employs non-porous material selected from the group consisting essentially of: a metal, a metal alloy, a steel
25 alloy, a stainless steel, a composite material, a composite material containing at least some metal, and combinations thereof.
3. The method of claim 1 in which said barrier employs non-porous material comprising at least in part at least one metal.

4. The method of claim 1 in which porous material encompassing said barrier comprises at least in part concrete.
5. The method of claim 4 employing said adhesive material comprising at least in part a thin set mortar at a thickness of about 6 mm (0.25 inch).
6. The method of claim 1 applying said topmost section comprised at least in part of concrete at a thickness of about at least 2.5 cm (1.0 inch).
7. The method of claim 1 establishing said seal at least in part by applying a continuous bead of at least one sealant along the entire length between each said overlapped edge, wherein said sealant remains flexible upon curing.
8. The method of claim 7 employing a RTV sealant as said at least one sealant.
9. The method of claim 1 employing said at least one panel comprised of at least one plate of a total thickness less than about 6 mm (0.25 inch).
10. The method of claim 9 employing said at least one plate comprised of a first perforated plate abutted about its entire surface area to a second solid plate, each said first and second plates being of a total thickness of less than about 3 mm (0.125 inch).
11. The method of claim 10 employing said first plate immediately adjacent the bottom side of said topmost section.
12. The method of claim 1 employing said at least one panel comprised of at least one foil of a thickness less than about 1 mm (4 mil).

13. The method of claim 12 employing said foil comprised of a first perforated foil placed abutted about its entire surface area to a second solid foil, each said first and second foils being of a total thickness of less than about 2 mm (8 mil).

5 14. The method of claim 13 employing said first perforated foil immediately adjacent the bottom side of said topmost section.

10 15. The method of claim 1 employing at least one expansion joint through each said top section and a corresponding portion of said underlayment, each said configuration further comprised of a non-porous expandable strip that is placed over said plates at said expansion joint to overlap the entire length of each side of said expansion joint below said top section, each overlap of a width less than about 5.0 cm (2.0 inches),

15 wherein said strip is sealed along each longitudinal edge of said strip between said strip and said topmost portion of each said panel abutting said expansion joint with a continuous bead of sealant along the entire length of said expansion joint, said sealant remaining flexible upon cure.

20 16. A configuration implementing a barrier to fluid passage in at least one direction, said barrier embedded between a first section and a second section of porous material, comprising:

at least a topmost layer of adhesive material applied to a first surface of said first section;

25 at least one panel of non-porous material affixed to said topmost layer of adhesive material so as to completely cover said topmost layer of adhesive material,

wherein if more than one said panel is required, all edges of each said panels are overlapped with any adjacent said panels and sealed continuously along each said overlapped edge; and

30 a second section, having a top side and a bottom side positioned closest to said first section and a thickness much less than said sides and said

thickness defining the space interposed between said sides, to be emplaced upon said panels so as to completely cover all said panels, wherein placement of said top section establishes a durable surface and affixes said barrier in place.

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17. The configuration of claim 16 in which said barrier employs non-porous material selected from the group consisting essentially of: a metal, a metal alloy, a steel alloy, a stainless steel, a composite material, a composite material containing at least some metal, and combinations thereof.

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18. The configuration of claim 16 in which said non-porous material comprises at least in part at least one metal.

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19. The configuration of claim 16 in which said porous material comprises at least in part concrete.

20. The configuration of claim 19 in which said adhesive material comprises at least in part a thin set mortar at a thickness of about at least 6 mm (0.25 inch).

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21. The configuration of claim 16 in which said top section comprises at least in part concrete at a thickness of about at least 2.5 cm (1.0 inch).

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22. The configuration of claim 16 in which said sealing is accomplished at least in part by applying a continuous bead of at least one sealant, wherein said sealant remains flexible upon curing.

23. The configuration of claim 22 in which said at least one sealant is a RTV sealant.

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24. The configuration of claim 16 in which said at least one panel comprises at least one plate of a total thickness less than about 6 mm (0.25 inch).

25. The configuration of claim 24 in which said plate comprises a first perforated plate abutted about its entire surface area to a second solid plate, each said first and second plates being of a total thickness of less than about 3 mm (0.125 inch).
- 5 26. The configuration of claim 25 in which said plates are joined via means selected from the group consisting of: tack welding, soldering, gluing, heating, applying pressure, and combinations thereof.
- 10 27. The configuration of claim 25 in which said first perforated plate is placed immediately adjacent said bottom side of said top section.
28. The configuration of claim 16 in which said at least one panel comprises at least one foil layer of a thickness less than about 1.0 mm (4 mil).
- 15 29. The configuration of claim 28 in which said foil comprises a first perforated foil layer abutted about its entire surface to a second solid foil layer, each said first and second foil layer being of a total thickness of between about 0.25 mm (1 mil) and 0.76 mm (3 mil).
- 20 30. The configuration of claim 29 in which said layers are joined via means selected from the group consisting of: tack welding, soldering, gluing, heating, applying pressure, and combinations thereof.
- 25 31. The configuration of claim 29 in which said first perforated foil is placed immediately adjacent said bottom side of said top section.
- 30 32. The configuration of claim 28 in which said each foil layer is further configured with a pleated edge along at least one edge of each said foil layer, wherein said at least one pleated edge facilitates flexion of said foil layer when under load thus serving to resist breach of said foil layer via shear forces.

33. The configuration of claim 28 in which said at least one foil layer comprises a first pleated foil abutted about its entire surface to a first surface of a solid foil and a second pleated foil abutted about its entire surface to a second surface of said solid foil, each said first and second pleated and said solid foil being of a total thickness of between about 0.25 mm (1 mil) and 0.76 mm (3 mil).

34. The configuration of claim 33 in which said layers are joined via means selected from the group consisting of: tack welding, soldering, gluing, heating, applying pressure, and combinations thereof.

35. The configuration of claim 16 in which said first and second sections each incorporate at least one expansion joint and said configuration further comprises a non-porous expandable strip overlapping the entire length of said edges of said panels abutting said expansion joint, each overlap of a width less than about 5.0 cm (2.0 inches),

wherein said strip is sealed along each longitudinal edge of said strip between said strip and said topmost portion of each said panel abutting said expansion joint with a continuous bead of sealant along the entire length of said expansion joint, said sealant remaining flexible upon cure.